

```
;;
conclude cl
action:
write bmi
return clas
;;
urgency: 90
```

ARDENSUITE

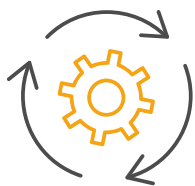
The clinical decision support factory

based on HL7's Arden Syntax on FHIR

FUZZY LOGIC

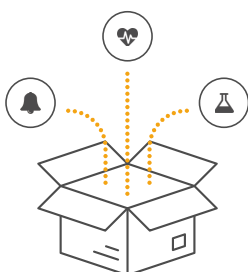
The ArdenSuite clinical decision support factory is a unique and versatile solution for creating customized clinical decision support (CDS) and knowledge-based artificial intelligence (AI). Add our ready-to-use medical content modules or create your own, tailor-made CDS solution yourself (or with our help). Integrate the ArdenSuite easily into your existing IT infrastructure, such as hospitals, laboratories, doctor's offices, or research and teaching institutions.

We support you every step of the way in creating a custom-built CDS solution that fits your unique tasks and requirements. Initially without specific clinical content, the ArdenSuite can be applied in every medical discipline or can even be used for administrative and quality management applications.



THE ARDENSUITE CORE

Installed without specific clinical content, the ArdenSuite is applicable in every medical discipline. Besides the engine that processes the medical logic modules (MLMs), the software also provides a UI for MLM and extension management as well as an editor for creating and testing MLMs.



THE CONTENT

Clinically proven knowledge packages written in Arden Syntax (rules, tables, guidelines, interpretations, reminders, alerts, recommendations, scores, adverse events, and others). Content that meets your needs. Developed in-house, custom-ordered, or as application-ready packages.



THE INTEGRATION

Connect to any data source or integrate the ArdenSuite into existing IT infrastructure. Use it as stand-alone application or let the results be displayed on your connected external medical information system.

Set up the ArdenSuite STEP 1

Our content is written in **HL7's Arden Syntax** standard. It has been developed for clinical contexts and is specifically tailored to support doctors and medical staff in their daily work. Due to the integration of fuzzy concepts, linguistic as well as propositional uncertainty can be taken into account. The integration of **fuzzy logic** into the Arden Syntax is globally unrivaled. Since Arden Syntax version 3.0, direct access to patient data via **HL7's FHIR** standard is provided. Moreover, the ArdenSuite can be combined with our ontology system to achieve linguistic bottom-up preprocessing. Set up your ArdenSuite to write and test MLMs, upload and manage these MLMs as part of your MLM projects, and manage data access via our REST API and our extensions.

ClinAlerts_TROP_troponin ✓

Medexter Healthcare | Knowledge engineering team

↓ 9 MLMs

Troponin-Alert-DB

Hospital's FHIR Repository

Troponin-Test-DB

v. 2.1

updated 05/27/2024 10:15

ClinAlerts_TROP_max-value ✓

Medexter Healthcare | Knowledge engineering team

↑ 1 MLM

↓ 3 MLMs

v. 2.1

updated 05/27/2024 10:17

ClinAlerts_TROP_infarct-check ✓

Medexter Healthcare | Knowledge engineering team

↑ 1 MLM

↓ 2 MLMs

v. 2.1

updated 05/27/2024 10:18

ClinAlerts_TROP_trop-check-in-y-hours ⚙️

Medexter Healthcare | Knowledge engineering team

↓ 6 MLMs

v. 2.1

updated 05/27/2024 10:22

ClinAlerts_TROP_second-trop-check-in-z-hours ✓

Medexter Healthcare | Knowledge engineering team

↓ 6 MLMs

v. 2.1

updated 05/27/2024 10:30

ClinAlerts_TROP_discharge ✓

Medexter Healthcare | Knowledge engineering team

↓ 6 MLMs

v. 2.1

updated 05/27/2024 10:32

```

// Execute FHIR query to get the most recent (latest) troponin observation
troponin_I_cardiag_valueset := new ValueSet with [system := "http://loinc.org", code := "LG433-9"];
troponin_fhir_observation := read as latest Observation
where it.code.coding.code in troponin_I_cardiag_valueset and it.subject = triggerEvent

;;
evolve:
;;
logic:
(withinInfarct, infarctStart, maxTrop) := call infarctcheck with triggerEvent; // withinInfarct -> true

HsIncreasedcheck := false;
alerts := (); // list of alerts to be returned
// Data preprocessing ++++++
// If no values found, handle accordingly
if not exists troponin_fhir_observation then
    conclude false;
endif;
TropHs := troponin_fhir_observation.valueQuantity.value;
// clinical rules ++++++
// [TropHs 1]: Slightly increased troponin value
if not withinInfarct or withinInfarct is null then
    if not prevTropHs or prevTropHs is null then
        if TropHs is less than cHsIncreased and TropHs is greater than cHsSlightlyIncreased then
            shortMsg := localized 'TropHs_2_short';
            longMsgTpl := localized 'TropHs_2_long';
            longMsg := (TropHs, time of TropHs) formatted with longMsgTpl || prevValueListHs;

            dummy := call event_trop_check_in_y_hours with triggerEvent; // triggering {trop_check
            dummy := call event_trop_max_value with triggerEvent, time of triggerEvent.value; //
            HsIncreasedcheck := true;

            newalert := call prepareAlert with triggerEvent, "TropHs 1", triggerTime, shortMsg, longMsg;
            alerts := alerts,newalert; // add the newly created alert to the list of alerts which will be
        endif;
    endif;

```

MLM Management with Extension, Debugging, and MLM Integration Details

Add your Content STEP 2

Add medical content modules to your ArdenSuite, creating your own, tailor-made CDS solution. We offer three kinds of medical content options for you to use along with your ArdenSuite:



Customized Medical Content by Medexter

Medexter's team of knowledge engineers works in close cooperation with experienced clinicians. We offer development of custom-built MLMs suited for your hospital's unique medical tasks and requirements with full support every step of the way.

MLM Editor



On-Site Customized Content Development

Our ArdenSuite represents an excellent and easy-to-use tool for you to write and test MLMs. In-house MLM development may have the benefit of close cooperation between your skilled hospital IT department and the clinical staff for whose patient care routine MLMs are written. For those who choose this option, we offer an introductory training session for MLM development as well as support by Medexter's knowledge engineering team.

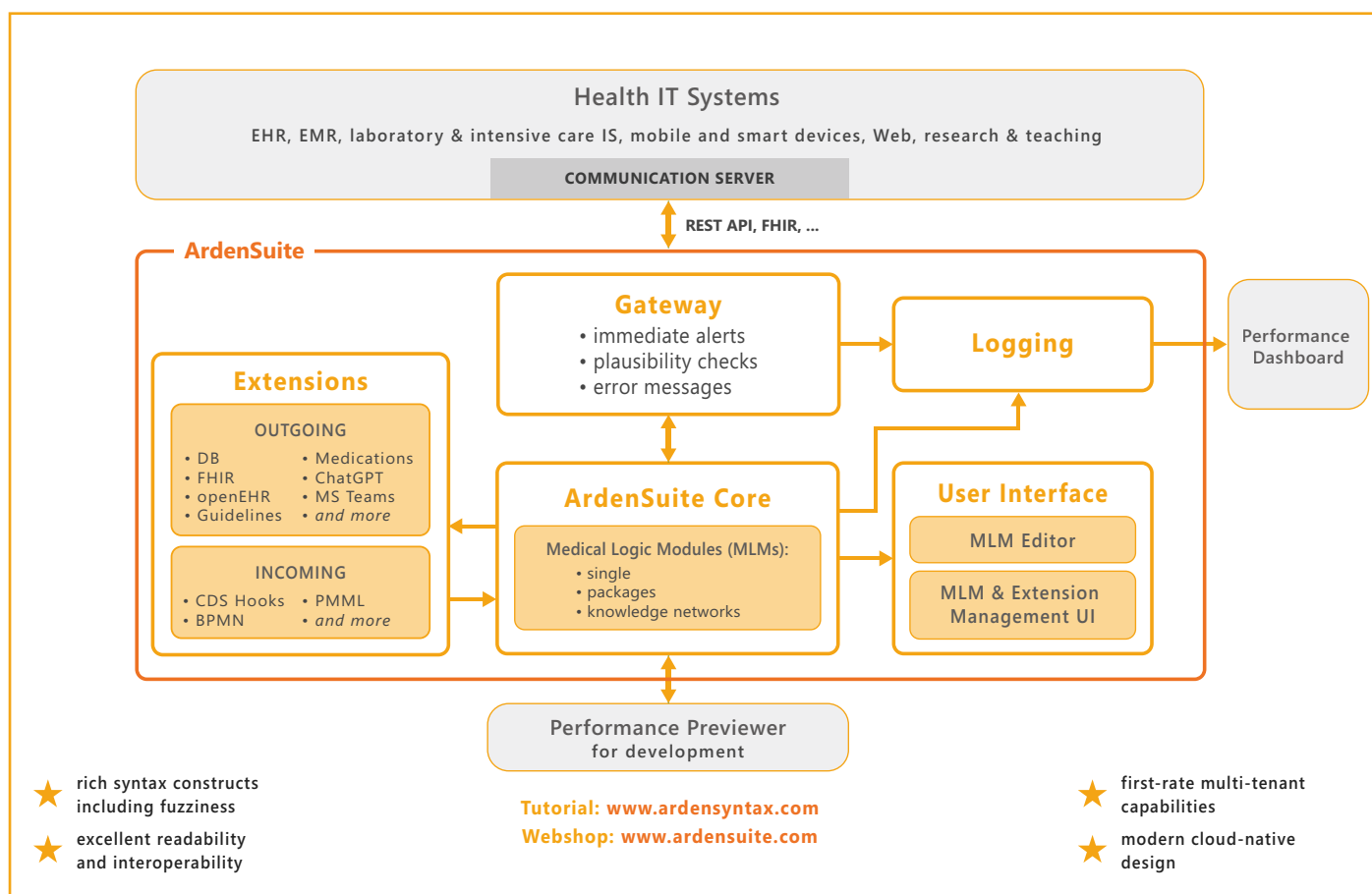


Application-Ready Content Packages

We offer several application-ready medical content packages that can be used with the ArdenSuite. They target different issues in clinical routine. At the moment, available packages are Clinical Alerts, Clinical Building Blocks, and Microbiological Building Blocks (for details please inquire).

Perfect Integration STEP 3

The ArdenSuite can be integrated in or connected with electronic health record (EHR) systems like Oracle Cerner's i.s.h.med, Epic, Philips' ICCA, Dräger's ICM, or others. Convenient integration into external systems, communication with data sources, as well as access to external resources is made possible through our ArdenSuite REST API and extensions (database, FHIR, openEHR, CDS Hooks, BPMN, PMML, and others).



ArdenSuite Integration into External Health IT Systems

Arden Syntax on FHIR

Below you see Arden Syntax reading a patient's body temperature (LOINC code 8310-5) from FHIR resources, if the body temperature is higher or equal 38.0 °C:

```
LET found_fever_observation[observation_id, patient, time_of_measurement, body_temp_celcius, physicians_interpretation]
BE READ AS Observation[identifier, subject, effectiveDateTime, valueQuantity.value, interpretation]
WHERE it.valueQuantity.value >= 38.0 AND it.valueQuantity.unit = "Cel" AND it.valueQuantity.system = "http://unitsofmeasure.org"
AND it.encounter = subject_encounter_id AND it.code.coding.system = "https://loinc.org" AND it.code.coding.code = "8310-5" ;
;;
```

Further Resources

The following additional ArdenSuite material is available on our website:

- *Architecture*
- *Integration b2b*
- *Integration Research & Education*
- *Online Learning Center*
- *Online Support Pages*
- *HL7's Arden Syntax Standard*
- *Scientific Publications*

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www.ardensuite.com

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